Cromemco Software Update Service Note Z80 Cromix-9

Date: May 21, 1984

Product: CROMIX-L and CROMIX-S

Release: 10

Date production of this version began: May 21, 1984 on 8"
                                                 May 21, 1984 on 5"

First serial number with this version: 10-10000   on 8"
                                                 10-10000   on 5"

SUMMARY

Version 11.26 of the Z80 Cromix® Operating System is now available and provides the following new and revised features:

1. Revised diskette configuration for 5-1/4" disks.
2. Revised Blink utility can link drivers for the C-10™ CDOS Operating System.
3. The Copy, Cptree, and Move utilities now zero the dump date of transferred files.
4. Revised Init utility now disables DMA on lower priority devices.
5. New Tarz80 utility replaces Backup and Restore.
6. Revised Screen utility updates files immediately after "Continue."
7. New driver for the STDC board.
8. Revised Typ driver starts printer automatically after paper refill or ribbon replacement.
9. Revised Octart driver now supports serial printers; both Octart and Quadart drivers now prompt for date after log-on message.

CROMIX DISKETTE CONFIGURATION

Disk 2 of CROMIX-S now has a **/bin** directory.

On both CROMIX-L and CROMIX-S, the **iostartup.iop.cmd, runqd.cmd, runtu.cmd,** and **ttys.iop** files have been deleted from the **/etc** directory.

CROMIX UTILITIES

Blink Utility

The new **-c** option allows users to link a bit-mapped, self-relocating file that can be executed on C-10 CDOS using command files. This option generates a self-relocating file which, when loaded into the C-10 memory, loads just below CDOS

and sets high memory to the byte just below itself. It loads correctly even if a batch file is executing. This option is used to link drivers for C-10 CDOS.

Also, the -x option now works with large files.

Copy, Cptree, and Move Utilities

The Copy, Cptree, and Move utilities now set the dump date of transferred files to "000-00-1900."

Init Utility

The revised Init utility, incorporating new WDI-II drivers, now disables DMA on lower priority devices (i.e., the STDC) during critical timing loops of hard disk initialization. This assumes installation of the DMA priority cable as discussed in the Cromemco STDC Disk Controller Manual (part number 023-2031). But with or without the cable, **Cromemco strongly recommends that no other processes be running while initializing a hard disk or floppy diskette.**

Tarz80 Utility

The new Tarz80 utility (for privileged users) replaces Backup and Restore for the creation and retrieval of back-up files and directories. Note that files saved with Backup cannot be restored with Tarz80. Directories may have up to 15 levels. Tar "archives" can be created on tape, floppy disk, or an ordinary file. Floppy disks must be initialized for Cromix, and can be single- or double-sided, and single- or double-density. The command format is shown below:

tarz80 -[rxtc{vwfblmkoi}] {archive block kilo} {files}

arguments:
r	add files to end of archive
x	extract files from archive
t	list files on archive
c	create files on new archive

options:
v	lists the name of the file being processed
w	waits for user confirmation before processing
f	the next argument will be the name of the archive
b	the next argument will be the blocking factor
l	unresolved links are reported
m	modification times are not restored
k	the next argument will be the archive volume size
o	do not check for overwriting of existing archive
i	cancels use of the file system identifier on floppy disks.

The arguments (one per command) are as follows:

r The named files/directories are added to the end of an existing archive.

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x   The named files/directories are extracted from the archive and transferred to the current directory (unless the extracted files are defined by absolute pathnames). The owner, modification time, and access privileges are restored for both ordinary files and directories, except when a directory already exists, in which case its existing characteristics are preserved. If no file argument is given, the entire archive will be extracted. For tapes, if there are multiple entries for the same file, the last will overwrite all previous entries.

t   The named files/directories in the archive are listed.

c   Creates files on a new archive, but prompts for confirmation before overwriting existing data.

The options are:

v   Will list each file as it is processed. When used in conjunction with the **t** argument, a fuller description of the file is given.

w   Prompts for confirmation of each file to be processed. Responding with a **y** or **Y** confirms the action, otherwise it is cancelled.

f   Takes the next argument as the archive name. The default archive is **/dev/tp1**. If the name of the file is '-', tar writes to the standard output, or reads from the standard input, whichever is appropriate.

b   Takes the next argument as the blocking factor (the number of Tar blocks per tape block) on a new tape archive. Tar blocks are 512 bytes each. The maximum (and default) blocking factor is 16 blocks. Since tape archives are limited to 65,535 tape blocks, the maximum size of a tape archive can vary from 32.7 megabytes to 524.3 megabytes. The blocking factor is determined automatically for existing tape archives.

l   Reports when links to the files are not resolved. (Use with **c** and **r** arguments.) If you run out of memory for the link table, the message

No room to check links for file : [filename]

will appear, and this file and the files linked to it will be written to the archive (instead of the normal procedure of saving only one copy of the file).

m   Modification times for extracted files will be changed to the time of extraction.

k   Takes the next argument as the size of the archive in kilobytes. This option is useful for splitting large files into separate "volumes" on fixed-size devices such as floppy disks. When creating a multi-volume archive, Tarz80 will prompt for the next volume. When extracting from a multi-volume archive, Tarz80 only prompts for a new volume if a split file has been partially restored. The maximum kilobyte sizes for floppy disks are:

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	Large Disks	Small Disks
Double-Density		
Double-Sided	1216K	390K
Single-Sided	608K	195K
Single-Density		
Double-Sided	608K	194K
Single-Sided	304K	97K

Tar does not check for exceeding the disk size unless the "k" option is used. (Implemented for floppy disks and ordinary files.)

o   When creating an archive, the "o" option omits the check for overwriting existing data.

i   When creating an archive on floppy disk, Tarz80 normally puts a file system identifier into the first 8 bytes of block 1 (2 bytes for the version of Cromix, a 3-byte string "tar", 1 zero byte, and 2 bytes for the version of Tarz80). Tarz80 checks for the identifier when adding, extracting, and listing, and will prompt for confirmation if it is incorrect. The "i" option cancels use of the identifier.

Examples

To view the progress of directory back-ups to a new archive of one or more small floppy disks, each limited to 390K bytes:

    tarz80 -cvfk /dev/sfdc 390 directory_names

To view the progress of a file back-up to an existing tape archive:

    tarz80 -rfv /dev/tp1 file1 file2 ...

To list the contents of a tape archive in long form:

    tarz80 -tvf /dev/tp1

Notes: If disk I/O errors occur while reading or writing a floppy disk archive, Tarz80 will attempt to recover. On read errors, Tarz80 will write the block to the Cromix file and display the location where the questionable block was written. On write errors, Tarz80 will stop writing the file, back up to where the file began, and write an end-of-archive at that point. Thus, the volume's prior contents will be intact. Tarz80 will then prompt for a new disk and try rewriting the file.

If the message **Cheksum error** appears, the integrity of the file just processed is questionable.

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Known Problems

Tarz80 cannot write to an uninitialized tape. To create an archive on an uninitialized tape, write a dummy file of 512 bytes or greater to the tape and use the Ddump utility as follows:

ddump if=/dev/tp1 of=[filename]

After the tape is reloaded, Tarz80 can write to the tape.

Tarz80 does not correctly create a new tape archive over an existing one of less than 512 bytes unless the "o" option is used.

SCREEN

When using "Continue" to update a file, the revised Screen utility will now update the file immediately, rather than risk losing the data by waiting until the buffers are full.

Also, when using multiple returns (e.g., **100 RETURN**) to move through a file, Screen now saves time by simply jumping the specified number of lines, rather than scrolling through the intervening text.

THE STDC DRIVER

Hardware

The Cromemco STDC hard-disk controller board uses an ST-506 interface to support a wide variety of 5-1/4" Winchester drives. With its own Z80A microprocessor, 64K bytes of RAM, and Direct Memory Access (DMA), the STDC allows the host CPU to continue executing instructions during disk read/write operations. Since the STDC can divide each drive into as many as 32 logical units, each user can have a separate "drive" and, if desired, the apparent disk size can be matched to a back-up medium. When installed, the STDC should be the last board in the priority interrupt chain. To run the STDC and WDI-II boards concurrently in the same system, the WDI-II must be modified (refer to the Cromemco STDC Disk Controller Manual, 023-2031).

Software Set-Up

Running the Crogen Utility

The Crogen utility generates a Cromix Operating System to suit a particular combination of I/O devices, root device, file access, etc. Log in as a privileged user and enter **/gen/crogen**. In the section under block device drivers Crogen now prompts:

6 - STD hard disk   (Y = Yes, N = No) <N> ?

Enter **Y** and Crogen prompts for the number of drive divisions (logical drives):

Maximum divisions for drive 0   (0-32) <2> ?
Maximum divisions for drive 1   (0-32) <0> ?

Enter at least **1** (no divisions) for the first prompt and press **RETURN** on the second prompt. You can also select the STD hard disk as the Cromix root device. Test the new operating system by giving the command **boot /gen/cromix.** If the system boots properly, copy the file **/gen/cromix.sys** to the boot diskette and the root directory.

Now enter **boot cromix** to load the new operating system.

Creating Device Files

To create device files for the STD hard disk, select **/dev** as the current directory and run the Makdev utility (as a privileged user) with the following format:

 # makdev [devname] b [majornum] [minornum]

For STD hard disks, the major device number (majornum) is **6**; the minor device numbers are shown below, along with the recommended device names:

Drive #	Drive Divisions	Device Name	Device Number Major : Minor
0	1	std0	6:0
0	2	std1	6:1
•	•	•	•
•	•	•	•
0	32	std31	6:31

You must run the Makdev utility once for each drive division you specified while executing Crogen (up to 32).

Running Initstdc

To format, declare alternate tracks, and set the disk partitions of an STD hard disk, enter initstdc (as a privileged user). **No other processes should be running while initializing hard disks or floppy diskettes.** The first prompt will be:

Disk to initialize (devname)?

Use any one of the device names you declared above with Makdev. If the disk has been previously formatted, the following prompt will appear:

Disk is already formatted. Do you wish to continue (Y/N) <N> ?

Answer **N** to terminate the program, or **Y** to continue. If you continue, the next five prompts are for drive specifications:

Number of data surfaces (heads)   <6.> ?
Number of cylinders   <306.> ?
Starting cylinder for alternate tracks   <153.> ?
Cylinder where write precomp will start <153.> ?
Do you wish to verify after write (Y/N) <Y> ?

Refer to your hard disk manual for the number of heads (up to 16) and cylinders (up to 1024). The starting cylinder for alternate tracks must be an area free of media defects. Write precompensation is usually set near the middle of the disk (on Vertex drives, which do not need precompensation, set the precomp value to the number of cylinders). If you answer **N** to "verify after write," drive operation will be faster, but tracks containing hard (fatal) or soft (system) errors will not be reported. The next prompt asks for the area of the disk to be formatted (the numbers in parentheses depend on the number of heads and cylinders entered above):

First cylinder (0-639.)?   <0.>

If you don't want to format the disk, enter **x** here to skip to "Declaring alternate tracks."

Last cylinder (0-639.)?   <639.>
First head (0-5.)?   <0.>
Last head (0-5.)?   <5.>

As the tracks are formatted, the cylinder and surface numbers will appear briefly on the screen. Assuming you selected verify after write (above), make note of the cylinder and surface (head) numbers of any disk errors that appear, such as:

Disk error: /dev/std0, cylinder 417., surface 0., sector 0, status FF04

When formatting is completed, the next message will be:

Declaring Alternate Tracks:

If no alternate tracks have been declared, you will see a message to that effect. Otherwise, they will be listed in the format below, and you must decide whether to redeclare them.

Existing alternate tracks:

#	hd	cyl	alt hd	alt cyl		#	hd	cyl	alt hd	alt cyl		#	hd	cyl	alt hd	alt cyl
0	0	417	1	320		1	unassigned					2	unassigned			
3	unassigned					4	unassigned					5	unassigned			
6	unassigned					7	unassigned					8	unassigned			
9	unassigned					10	unassigned					11	unassigned			
12	unassigned					13	unassigned					14	unassigned			
15	unassigned					16	unassigned					17	unassigned			
18	unassigned					19	unassigned					20	unassigned			
21	unassigned					22	unassigned					23	unassigned			
24	unassigned					25	unassigned					26	unassigned			
27	unassigned					28	unassigned					29	unassigned			

Do you wish to retain existing alternate tracks (Y/N) ?

Answer **Y** to keep the current alternate tracks. The next prompts will be:

Do you wish to declare an alternate track (Y/N) <N> ?
Enter bad track:
    Enter head – CR to stop (0-5):
    Enter cylinder (0-639):

Answer **Y** if the alternate track table does not have both all of the tracks reported as disk errors during formatting and all of the defective tracks listed by the manufacturer on the drive label. Enter the head and cylinder numbers of each bad track, then press RETURN to display the new track table.

Next you will be prompted for disk partitions. This is where you allocate disk space to the logical drives you specified while executing Crogen. Existing partitions are listed first, and you must decide whether to redeclare them:

Declaring Disk Partitions:
                     Existing partitions:
317.
Do you wish to retain disk partitions (Y/N) <N> ? Y

Do you wish to declare disk partitions (Y/N) <N> ? Y
    Starting cylinder of next partition – return to end (318-639) <end> ?

If you retain the existing partitions, new partitions can be added only after the last existing one. If you declare too many partitions for the number of divisions declared while executing Crogen (1 division = 0 partitions, 2 divisions = 1 partition, etc.), you will lose access to the disk space in the extra partitions.

Running Makfs

After initializing the drive with the Initstdc utility, set up the structure for a file system on the hard disk by running the Makfs utility as a privileged user. The command format is:

 # makfs devname

You must run the Makfs utility once for each device name (std0, std1, etc.) you declared on the hard disk.

STDC Interrupts and DMA Priority

Since Cromix won't allow the root device to be an interrupting driver, the STDC drivers start in a non-interrupting mode. To enable the interrupts, enter (as a privileged user):

 # stinton [-v] devname

The device name can be any of those already declared on the hard disk. The **-v** option will report the current and previous states of the interrupt mode. This command should be added to either the **startup.cmd** file or the **iostartup.cmd** file for automatic execution. Use **stintoff** to turn off the interrupts (same syntax as **stinton**).

If the STDC and WDI-II are to run concurrently in the same system, they must be linked by a DMA priority cable (in addition to the standard priority interrupt cable) to prevent the faster STDC from seizing control of the bus during WDI-II operations (refer to the Cromemco STDC Disk Controller Manual, 023-2031).

TYP DRIVER

When a printer runs out of paper or ribbon, the revised Typewriter Printer Driver will restart the printer automatically after a paper refill or ribbon replacement, without the user having to call the Mode utility.

THE OCTART AND QUADART DRIVERS

When booting Cromix with the main console connected to either an Octart or Quadart, the date prompt after the log-on message is no longer skipped.

Serial Printers

The revised **octart.iop** program now supports up to 32 serial printers (8 printers per Octart, 4 Octarts per system). The table below gives the serial printer device names, their major and minor device numbers, and the Octart base port address settings (refer to the Cromemco Octart Board Manual, 023-2028) needed to support them. If you use both IOP/Quadarts and Octarts in the same system, their base addresses must be distinct. Note that when using a serial printer, the Spool utility cannot function if the minor device number exceeds 99.

Device Name	Octart	Base Port	Device Number Major : Minor
qslpt1	Octart(1)	CEh	9:0
qslpt2	Octart(1)	CEh	9:1
qslpt3	Octart(1)	CEh	9:2
qslpt4	Octart(1)	CEh	9:3
qslpt5	Octart(1)	CEh	9:4
qslpt6	Octart(1)	CEh	9:5
qslpt7	Octart(1)	CEh	9:6
qslpt8	Octart(1)	CEh	9:7
qslpt17	Octart(2)	BEh	9:16
qslpt18	Octart(2)	BEh	9:17
qslpt19	Octart(2)	BEh	9:18
qslpt20	Octart(2)	BEh	9:19
qslpt21	Octart(2)	BEh	9:20
qslpt22	Octart(2)	BEh	9:21
qslpt23	Octart(2)	BEh	9:22
qslpt24	Octart(2)	BEh	9:23
qslpt33	Octart(3)	AEh	9:32
qslpt34	Octart(3)	AEh	9:33
qslpt35	Octart(3)	AEh	9:34
qslpt36	Octart(3)	AEh	9:35
qslpt37	Octart(3)	AEh	9:36
qslpt38	Octart(3)	AEh	9:37
qslpt39	Octart(3)	AEh	9:38
qslpt40	Octart(3)	AEh	9:39

qslpt49	Octart(4)	9Eh	9:48
qslpt50	Octart(4)	9Eh	9:49
qslpt51	Octart(4)	9Eh	9:50
qslpt52	Octart(4)	9Eh	9:51
qslpt53	Octart(4)	9Eh	9:52
qslpt54	Octart(4)	9Eh	9:53
qslpt55	Octart(4)	9Eh	9:54
qslpt56	Octart(4)	9Eh	9:55

CROMIX-L (8") Disks

Files in /

| cromix.sys | 11.26 | -new- |

Files in /bin

access.bin	00.06	
blink.bin	00.15	-new-
boot.bin	00.02	
ccall.bin	00.07	
cdoscopy.bin	00.15	
cdosfix.bin	00.01	
chowner.bin	00.06	
cmpasc.bin	00.05	
compare.bin	00.07	
copy.bin	00.12	-new-
cptree.bin	00.10	-new-
day.bin	01.02	
dcheck.bin	00.12	
ddump.bin	02.02	
deltree.bin	00.03	
dump.bin	00.10	
echo.bin	00.05	
ed.bin	01.47	-new-
find.bin	00.07	
flush.bin	00.01	
free.bin	00.09	
group.bin	00.01	
h.bin	00.04	
help.bin	00.04	
icheck.bin	00.15	
idump.bin	00.06	
init.com	02.83	-new-
initstdc.bin	00.02	-new-
input.bin	01.00	
l.bin	00.11	
ls.bin	00.01	
mail.bin	02.02	
makdev.bin	00.07	
makfs.bin	00.13	
maklink.bin	00.04	
match.bin	00.03	
mode.bin	01.15	

mount.bin	00.14	
move.bin	00.11	-new-
msg.bin	00.08	
ncheck.bin	00.09	
passwd.bin	00.09	
patch.bin	00.03	
priv.bin	00.07	
rfile.bin	00.07	
root.bin	00.02	
screen.bin	01.47	-new-
sfile.bin	00.07	
sim.bin	02.67	
sort.bin	00.06	
spool.bin	00.12	
tarz80.bin	11.00	-new-
tee.bin	01.03	
testinp.bin	01.01	
time.bin	00.07	
unmount.bin	00.11	
usage.bin	00.06	
version.bin	00.10	
wboot.bin	00.09	
who.bin	00.06	

Files in /etc

fdboot	00.11	
hdboot	00.05	
ioload.bin	03.01	
login.bin	00.02	
octart.iop	11.20	-new-
oct_reset.bin	01.00	
quadart.iop	11.22	-new-
sfdboot	00.11	
stintoff.bin	00.02	-new-
stinton.bin	00.02	-new-

Files in /gen

crogen.bin	00.30	-new-
crolib.rel		
default.bin	00.02	
iolib.rel		-new-

CROMIX-S (5-1/4") Disks

Disk 1:

Files in /

cromix.sys	11.26	-new-

Files in /bin

access.bin	00.06	

blink.bin	00.15	-new-
boot.bin	00.02	
ccall.bin	00.07	
cdoscopy.bin	00.15	
chowner.bin	00.06	
cmpasc.bin	00.05	
compare.bin	00.07	
copy.bin	00.12	-new-
cptree.bin	00.10	-new-
day.bin	01.02	
dcheck.bin	00.12	
ddump.bin	02.02	
deltree.bin	00.03	
dump.bin	00.10	
echo.bin	00.05	
ed.bin	01.47	-new-
find.bin	00.07	
flush.bin	00.01	
free.bin	00.09	
group.bin	00.01	
h.bin	00.04	
help.bin	00.04	
icheck.bin	00.15	
idump.bin	00.06	
init.com	02.83	-new-
initstdc.bin	00.02	-new-
input.bin	01.00	
l.bin	00.11	
mail.bin	02.02	
makdev.bin	00.07	
makfs.bin	00.14	
maklink.bin	00.04	
match.bin	00.03	
mode.bin	01.15	
mount.bin	00.14	
move.bin	00.11	-new-
msg.bin	00.08	
ncheck.bin	00.09	
passwd.bin	00.09	
patch.bin	00.03	
priv.bin	00.07	
rfile.bin	00.07	
root.bin	00.02	
screen.bin	01.47	-new-
sim.bin	02.67	
sort.bin	00.06	
spool.bin	00.12	
tee.bin	01.03	
testinp.bin	01.01	
time.bin	00.07	
unmount.bin	00.11	
usage.bin	00.06	
version.bin	00.10	
wboot.bin	00.09	

wboot.bin	00.09	
who.bin	00.06	

Files in **/etc**

fdboot	00.11	
hdboot	00.05	
login.bin	00.02	
sfdboot	00.11	

Files in **/gen**

crogen.bin	00.30	-new-
crolib.rel		
default.bin	00.02	
iolib.rel		-new-

Disk 2:

Files in **/bin**

tarz80.bin	11.00	-new-

Files in **/etc**

ioload.bin	03.01	
octart.iop	11.20	-new-
oct_reset.bin	01.00	
quadart.iop	11.22	
stintoff.bin	00.02	-new-
stinton.bin	00.02	-new-

Disk 3:

Help files